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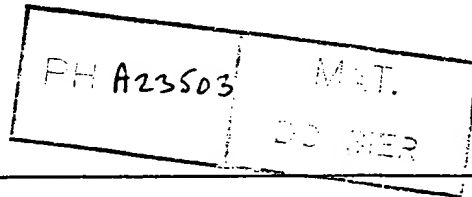
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S2207 S2212 S2400

(56) Documents Cited

GB 2285158 A GB 2204755 A GB 2162978 A  
GB 2092347 A

(58) Field of Search

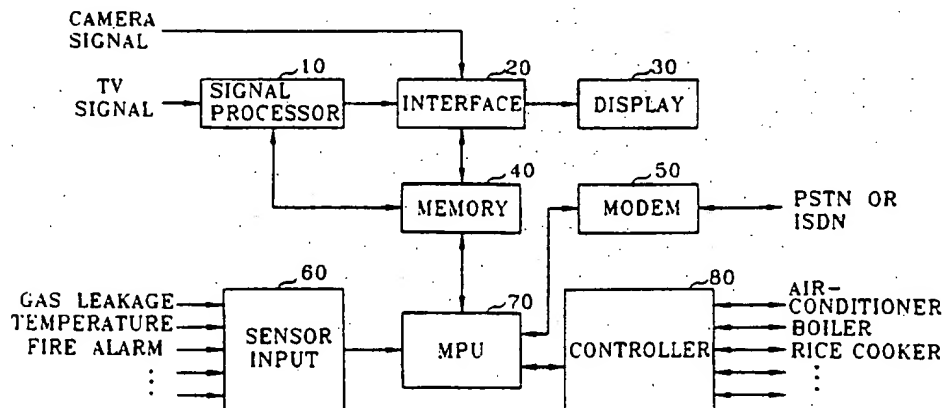
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(54) Home automation

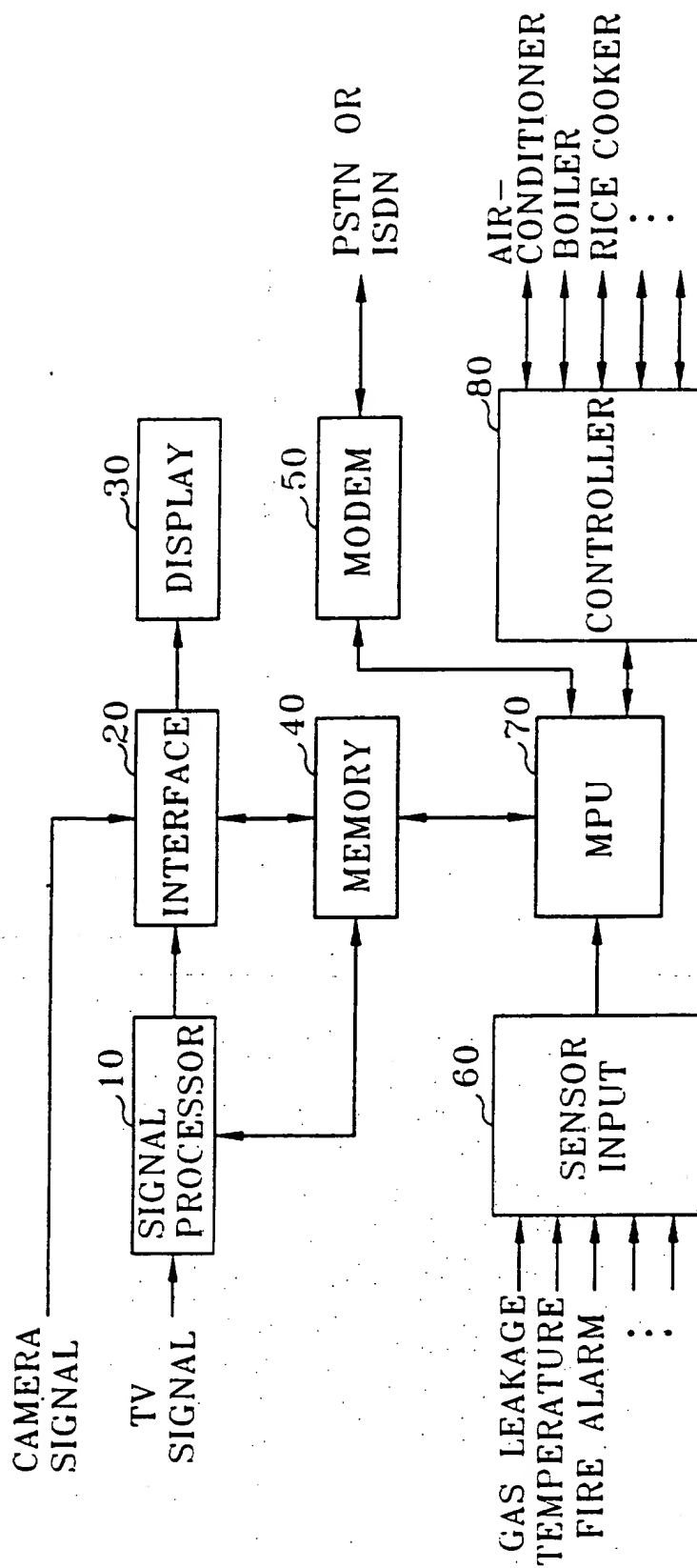
(57) A home automation apparatus using a digital TV receiver having a digital signal processor 10 for decoding an input TV signal, a memory unit 40 for temporarily storing the input TV signal and storing the signal-processed data, a microprocessing unit (MPU) 70 for controlling the data stored in the memory unit 40, and a display portion 30 for displaying the processed data as a picture thereon is provided, which includes a sensor input portion 60 for detecting various conditions of household affairs and outputting the result to the MPU 70, an interface portion 20 for outputting an input signal supplied from an external source as well as the TV signal decoded in the signal process 10, to the display portion 30, and a control portion 80, coupled to various home electric appliances for performing various household affairs, for controlling the home electric appliances under control of the MPU 70. The home automation apparatus using a digital TV receiver effectively uses the high-performance MPU 70 and the large-capacity memory unit 40 both of which are installed in the digital TV receiver. A satellite broadcasting receiver may replace the digital receiver.

FIG. 1



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FIG. 1



- 1 -

HOME AUTOMATION APPARATUS USING DIGITAL TV RECEIVER

The present invention relates to a home automation apparatus using a digital TV receiver which can realize home automation by use of part of circuits of the digital TV receiver.

A digital TV receiver receives and processes digital video and audio signals. To process a large amount of digital data, the digital TV receiver has a high-performance microprocessing unit (herein after called MPU) and large-capacity memories. The MPU and the memories are used only during receiving TV broadcasting signals via the digital TV receiver.

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Meanwhile, a home automation apparatus automatically checks the state of various household affairs and informs a user of the checked result, or remotely controls various home electric appliances installed in a house.

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Thus far, the digital TV receiver and the home automation apparatus are independently installed. Accordingly, the MPU and the memories in the digital TV receiver cannot be shared with the home automation apparatus. Also, when a digital TV receiver does not operate to view a TV broadcasting program, the MPU and the memories incorporated in the digital TV receiver cannot be used in other apparatus such as a home automation apparatus.

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With a view to solving or reducing the above problem, it is an aim of embodiments of the present invention to provide a home automation apparatus using a digital TV receiver in which the digital TV receiver is incorporated with constitutional elements of the home automation

apparatus, to enable the home automation apparatus to make use of an MPU and memories internally installed in the digital TV receiver, even though a TV broadcasting program is not viewed.

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According to an aspect of the present invention, there is provided a home automation apparatus comprising a digital TV or satellite broadcast receiver, the apparatus utilising circuitry of the receiver to monitor one or more household affairs.

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The apparatus may further comprise any one or more features from the accompanying description, claims, abstract or drawings, in any combination.

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According to a second aspect of the present invention, there is provided a home automation apparatus using a digital TV receiver having a digital signal processor for decoding an input TV signal, a memory unit for temporarily storing the input TV signal and storing the signal-processed data, a microprocessing unit (MPU) for controlling the data stored in the memory unit, and a display portion for displaying the processed data as a picture thereon, the home automation apparatus comprising

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a sensor input portion for detecting various conditions of household affairs and outputting the result to the MPU;

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an interface portion for outputting an input signal supplied from an external source as well as the TV signal decoded in the signal processing portion, to the display portion; and

a control portion, coupled to various home electric appliances for performing various household affairs, for controlling the home electric appliances under control of the MPU.

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Preferably, the apparatus further comprises a modem for supplying external information for controlling home appliances to said MPU, or for calling a user under control of said MPU to inform the user of the state of said home appliances.

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Said display unit may output the TV signal decoded in said signal processor and a signal input from an external source in picture-in-picture fashion.

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Said display unit may output the TV signal decoded in said signal processor and a signal input from an external source in double window fashion.

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Controlling of each home appliance in said control portion is preferably performed via a reserve function using a timer installed in said digital TV receiver.

For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings, in which:

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Figure 1 is a block diagram of an embodiment of home automation apparatus using a digital TV receiver according to the present invention.

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A preferred embodiment of the present invention will be described below in more detail with reference to the accompanying drawing.

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In Figure 1, a home automation apparatus using a digital TV receiver according to an embodiment of the present invention includes a signal processor 10 for decoding an input TV signal, an interface portion 20 for transferring the signal-processed data to a display portion 30 which outputs the received data as a picture.

The Figure 1 apparatus includes a memory unit 40 for temporarily storing the input TV signal or storing the signal-processed data therein and an MPU 70 for controlling the data stored in the memory unit 40. Also, in order to provide a user with subscription service of paid programs (pay-per-view), a modem 50 is installed in the home automation apparatus in order to communicate with a member control centre of the paid program service station.

In addition, the Figure 1 apparatus includes a sensor input portion 60 for transferring information such as gas leakage and fire alarm detected by various sensors installed in a house to perform home automation, to the MPU 70, and a controller 80 for controlling various home electric appliances under control of the MPU 70.

Meanwhile, a screen of the digital TV receiver shown in Figure 1 can be used as a display unit of a door-phone. That is, a signal input from an external camera can be output by the display unit 30 via the interface portion 20.

The operation of the embodiment constructed as described above will be described below in detail.

First, the Figure 1 apparatus performs an intrinsic function for receiving TV broadcasting programs. The

signal processor 10 receives a bitstream of the digital encoded TV signal and decodes the received TV signal. The interface portion 20 outputs the decoded TV signal supplied from the signal processor 10 to the display portion 30 when a user watches the TV.

Meanwhile, the Figure 1 apparatus further comprises an additional constitutional element for home automation. The sensor input portion 60 detects the state of household affairs such as fire alarm, gas leakage and a break-in and outputs the result to the MPU 70. The MPU 70 analyzes the detection result supplied from the sensor input portion 60 and stores information on the circumstance change of the house in the memory unit 40. In this case, it is detected whether or not the circumstance of the house is normal, and the detected information is output via the display unit 30 through controlling of the interface portion 20 when a user watches the TV. The display unit 30 displays the information on an abnormal situation on a screen when a signal is generated due to the change of the circumstance of the house or if there is a request from the user. The display unit 30 can display an abnormality situation on a picture-in-picture screen or a double window screen together with a currently viewing program, or display only an abnormality situation on the screen.

Meanwhile, when a user is out of the house, the home automation apparatus according to the present invention can inform the user of the state of home appliances by calling the user at a predetermined telephone number, using a modem 50 connected to a PSTN or ISDN (integrated services digital network). Also, information for controlling home appliances is supplied by using the modem 50 during absence of the user. The information is stored in the memory unit 40 via the MPU 70. The MPU 70 reads

the stored information from the memory unit 40 to generate a control signal for a corresponding home appliance such as an air conditioner, a boiler and a rice cooker, and outputs the generated control signal to the corresponding home appliance via the controller 80. The controlling of each home appliance by the controller 80 may be performed through a reserve function using a timer (not shown) installed in the digital TV receiver.

10 A home automation apparatus using a digital TV receiver has been described in a preferred embodiment of the present invention. However, it is possible to use a satellite broadcasting (DBS) receiver adopting a digital broadcasting system instead of a digital TV receiver.

15 As described above, the home automation apparatus using a digital TV receiver according to the present invention effectively uses the high-performance MPU and the large-capacity memory unit both of which are installed in the digital TV receiver.

20 While only certain embodiments of the invention have been specifically described herein, it will be apparent that numerous modifications may be made thereto without departing from the scope of the invention.

25 The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

30 All of the features disclosed in this specification (including any accompanying claims, abstract and



drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

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Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

10 The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any  
15 method or process so disclosed.  
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**CLAIMS**

1. A home automation apparatus using a digital TV receiver having a digital signal processor for decoding an  
5 input TV signal, a memory unit for temporarily storing the input TV signal and storing the signal-processed data, a microprocessing unit (MPU) for controlling the data stored in the memory unit, and a display portion for displaying the processed data as a picture thereon, the home  
10 automation apparatus comprising:

a sensor input portion for detecting various conditions of household affairs and outputting the result to said MPU;

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an interface portion for outputting an input signal supplied from an external source as well as the TV signal decoded in said signal processing portion, to said display portion; and

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a control portion, coupled to various home electric appliances for performing various household affairs, for controlling said home electric appliances under control of said MPU.

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2. The home automation apparatus using a digital TV receiver according to claim 1, further comprising a modem for supplying external information for controlling home appliances to said MPU, or for calling a user under  
30 control of said MPU to inform the user of the state of said home appliances.

3. The home automation apparatus using a digital TV receiver according to claim 1 or 2, wherein said display  
35 unit outputs the TV signal decoded in said signal

processor and a signal input from an external source in picture-in-picture fashion.

4. The home automation apparatus using a digital TV receiver according to any of the preceding claims, wherein said display unit outputs the TV signal decoded in said signal processor and a signal input from an external source in double window fashion.

5. The home automation apparatus using a digital TV receiver according to any of the preceding claims, wherein controlling of each home appliance in said control portion is performed via a reserve function using a timer installed in said digital TV receiver.

6. Home automation apparatus comprising a digital TV or satellite broadcast receiver, the apparatus utilising circuitry of the receiver to monitor one or more household affairs.

7. Apparatus according to claim 6, further comprising any one or more features from the accompanying description, claims, abstract or drawing, in any combination.

8. Home automation apparatus substantially as herein described, with reference to the accompanying drawing.



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Application No: GB 9617196.2  
Claims searched: 1-8

Examiner: Mike Davis  
Date of search: 6 September 1996

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): G4H (HNP,HRE,HSD,HSE,HSU,HTL)

Int CI (Ed.6): G05B

Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2285158 A (MATSUSHITA ELECTRIC)	1,6,7 at least
X	GB 2204755 A (RCA)	.
X	GB 2162978 A (THORN...)	.
X	GB 2092347 A (RCA)	.

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.